

of the word "or" recites an alternative structure. Claim 10 is amended for clarification purposes but the word "or" remains therein. Under MPEP 2173.05 (h) II., it states that alternative expressions using "or" [in the claims] are acceptable. Withdrawal of the rejection is respectfully requested.

Newly-added claim 25 also includes features not shown in the applied art.

In view of the foregoing, reconsideration of the application and allowance of the pending claims are respectfully requested. Should the Examiner believe anything further is desirable in order to place the application in even better condition for allowance, the Examiner is invited to contact Applicants' representative at the telephone number listed below.

Should additional fees be necessary in connection with the filing of this paper or if a Petition for Extension of Time is required for timely acceptance of the same, the Commissioner is hereby authorized to charge Deposit Account No. 18-0013 for any such fees and Applicant(s) hereby petition for such extension of time.

Respectfully submitted,

Date: March 13, 2003

By:



Carl Schaukowitch
Reg. No. 29,211

RADER, FISHMAN & GRAUER PLLC

1233 20th Street, N.W. Suite 501

Washington, D.C. 20036

Tel: (202) 955-3750

Fax: (202) 955-3751

Customer No. 23353

Enclosure(s): Appendix I (Marked-up Version of Amended Specification)
 Appendix II (Marked-up Version of Amended Claims)

DC114633

APPENDIX I

(MARKED-UP VERSION OF AMENDED SPECIFICATION)

~~SEMICONDUCTOR DEVICE AND METHOD FOR MANUFACTURING THE SAME~~
SEMICONDUCTOR DEVICE WITH CHIP-ON-CHIP CONSTRUCTION
JOINED VIA A LOW-MELTING POINT METAL LAYER

APPENDIX II

(MARKED-UP VERSION OF AMENDED CLAIMS)

1. (Amended) A semiconductor device comprising:
 - a first semiconductor chip having an electrode terminal:
 - a second semiconductor chip having an electrode terminal:
 - a bump ~~electrode~~ made of a first metal for joining said first and second semiconductor chips, said bump ~~electrode~~ being provided on at least one of said electrode terminal of said first semiconductor chip and said electrode terminal of said second semiconductor chip; and
 - an alloy layer formed on ~~a joining portion~~ said bump where said first and second semiconductor chips are joined with each other via said bump ~~electrode~~, said alloy layer being made of an alloy of said first metal and a second metal,
 - wherein said second metal is made of such a metal that can melt at a temperature lower than a melting point of said first metal and be alloyed with said first metal.

2. (Amended) A semiconductor device comprising:
 - a first semiconductor chip having an electrode terminal:
 - a second semiconductor chip having an electrode terminal:
 - a bump ~~electrode~~ made of a first metal for joining said first and second semiconductor chips, said bump ~~electrode~~ being provided on at least one of said electrode terminal of said first semiconductor chip and said electrode terminal of said second semiconductor chip; and
 - a third metal layer having a lower melting point than that of said first metal provided on ~~a joining portion~~ said bump where said first and second semiconductor chips are joined with each other via said bump ~~electrode~~

3. (Amended) A semiconductor device comprising:
 - a first semiconductor chip having an electrode terminal:
 - a second semiconductor chip having an electrode terminal:

a bump ~~electrode~~ made of a first metal for joining said first and second semiconductor chips, said bump ~~electrode~~ being provided on at least one of said electrode terminal of said first semiconductor chip and said electrode terminal of said second semiconductor chip; and

a detachable material portion provided on ~~a joining portion~~ said bump where said first and second semiconductor chips are joined with each other via said bump ~~electrode~~, said detachable material being made of such a material that said first and second semiconductor chips can be easily separated from each other at a temperature of 280°C to 500°C.

4. (Amended) The semiconductor device according to claim 1, 2, or 3, wherein said bump ~~electrode~~ is formed on said electrode terminal of each of said first and second semiconductor chips, so that ~~bump electrodes~~ bumps of said first and second semiconductor chips are joined to each other.

5. (Amended) The semiconductor device according to claim 1, 2, or 3, wherein said bump ~~electrode~~ is formed on said electrode terminal of one of said first and second semiconductor chips and a metal layer made of said first metal is formed on said electrode terminal of the other of said first and second semiconductor chips, so that said bump ~~electrode~~ and said electrode terminal are joined to each other.

6. (Twice Amended) The semiconductor device according to claim 1 or 2, wherein a second metal layer made of said second metal or said third metal layer is provided on a right surface and a side surface of said bump ~~electrode~~ made of said first metal, so that said first and second semiconductor chips are joined to each other via said alloy layer or via said third metal layer.

10. (Amended) A semiconductor device comprising:
a first semiconductor chip having an electrode terminal or ~~a wiring~~;
a second semiconductor chip having an electrode terminal or ~~a wiring~~;
and
a low-melting point metal layer provided on the surface of said electrode

~~terminal or wiring~~ of at least one of said first and second semiconductor chips,
wherein said first and second semiconductor chips are electrically interconnected and joined to each other via said low-melting point metal layer so that said electrode terminal or wiring ~~of the first semiconductor chip~~ is face to face ~~each other with said electrode terminal or wiring of the second semiconductor chip~~.

12. (Twice Amended) The semiconductor device according to claim 10, further comprising:

~~a second~~ an insulating layer provided between said wiring and a passivation film on the surface of said semiconductor chip to flatten the surface of said wiring.

18. (Twice Amended) The semiconductor device according to claim 1 or 2, further comprising:

an insulating resin layer provided at a gap between said first and second semiconductor chips joined each other to fill the gap, said insulating resin layer having nearly the same elastic modulus as said bump ~~electrode~~.